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CLAY WORKING MACHINERY



E.M.FREESE & CO.
GALION, OHIO, U.S.A.

1907

E. M. FREESE & CO.

GALION, OHIO

MANUFACTURERS OF

CLAY WORKING MACHINERY

AND

EQUIPMENT FOR CLAY
PLANTS

BRANCH OFFICES

NEW YORK, N. Y.

No. 220 BROADWAY

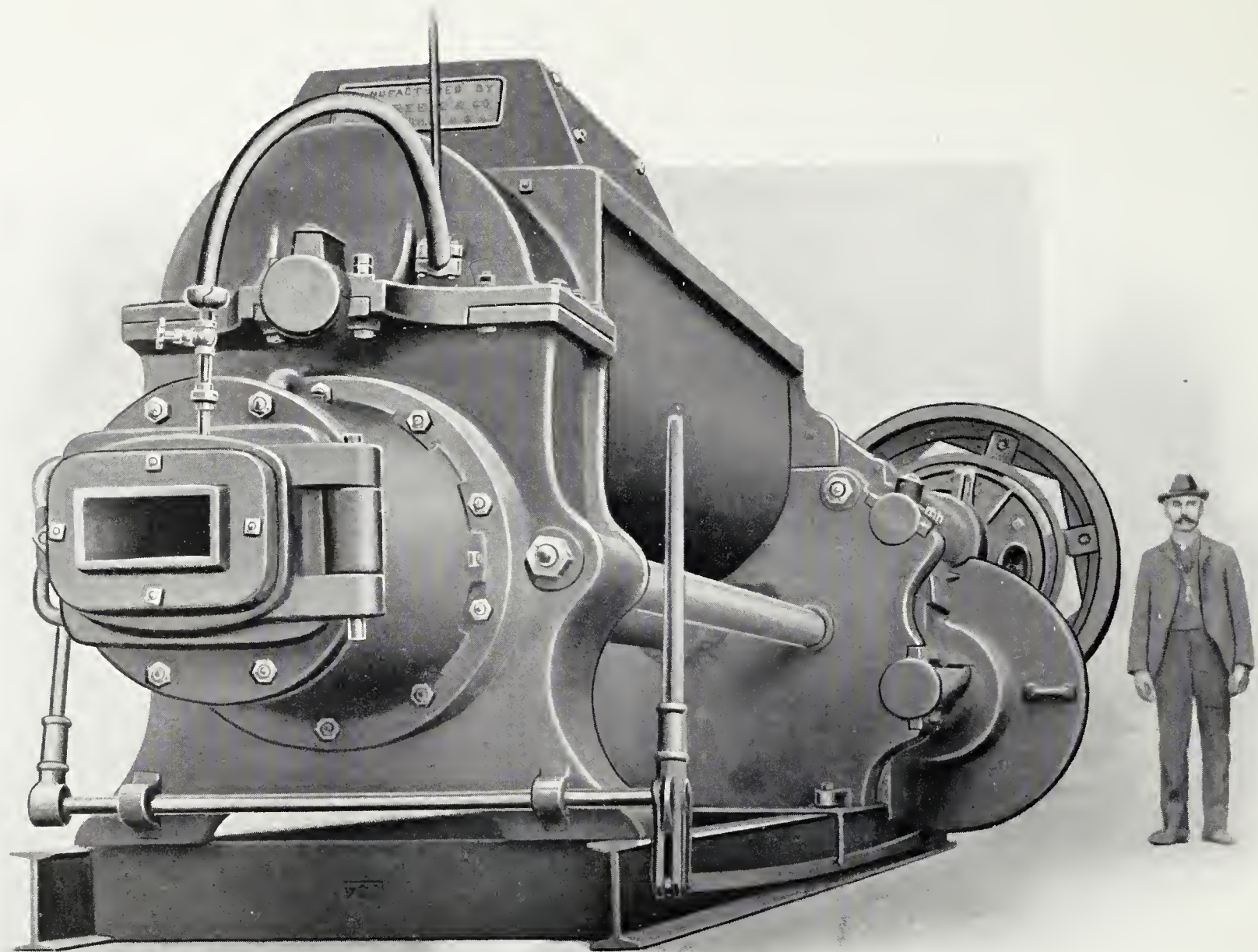
PITTSBURG, PA.

JACKSON BUILDING

PENN AVENUE AND SIXTH STREET

ST. LOUIS, MO.

No. 811 THE WAINWRIGHT



INTRODUCTORY

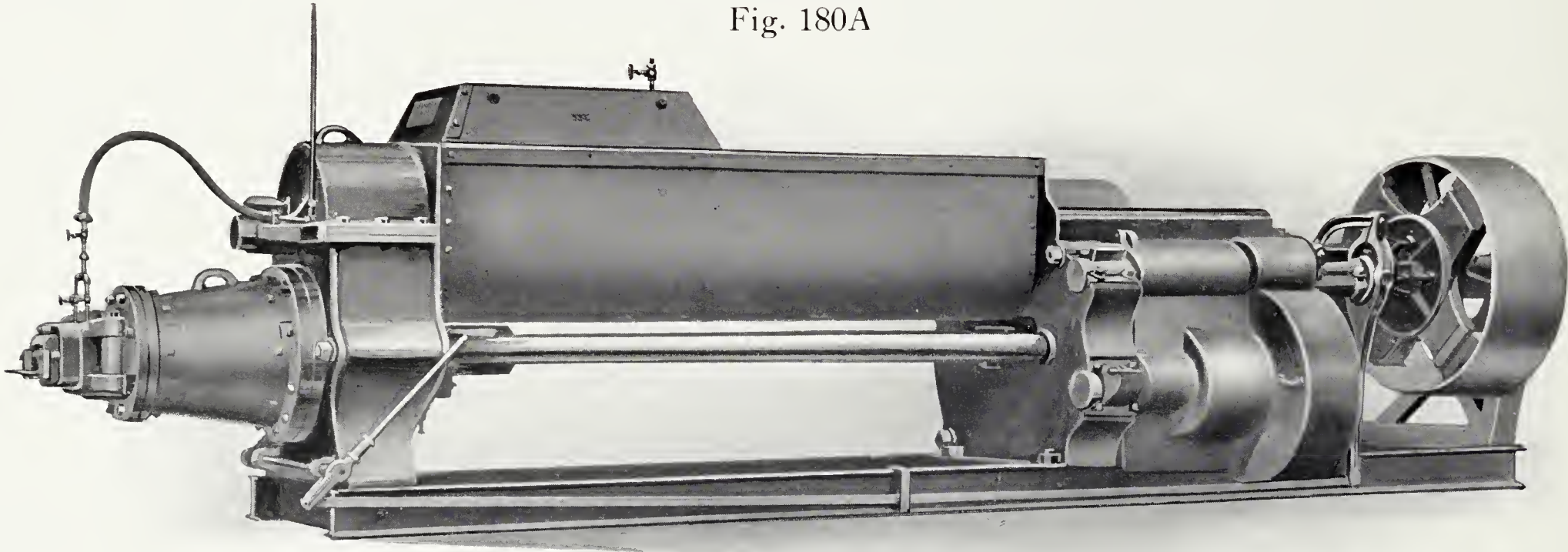
IN *this booklet we offer only a general idea of some of our products. For many years our time and energies have been concentrated in this work and we have taken pride in our calling, constantly seeking to add improvements and discard defects, and to meet the wants of the most exacting.*

Our machinery will be found eminently simple and practical. Its excellence has long been recognized.

It embodies original and careful design, sturdy solidity and robust proportions, and is well suited to the economical production of a great variety of clay wares of superior quality.

We are prepared to furnish the entire equipment for modern plants of large or small capacity for the manufacture of building, paving, or fire brick, hollow blocks, fireproofing, drain tile, etc.

Fig. 180A



“ J ” SIZE UNION MACHINE

Capacity, 60,000 to 120,000 brick per day.
Length, over all, 25' 7"
Height at front of Pug Mill, 6' 5"

OUR UNION BRICK MACHINES

WE were the originators of this type of stiff-mud brick machine, the first being placed on the market in 1894.

They proved successful from the beginning, and have since become very popular.

Other sizes of the same general design have been added to our list from time to time as has seemed necessary, and all have been perfected in various detail as has been found best to most completely fulfill their purposes.

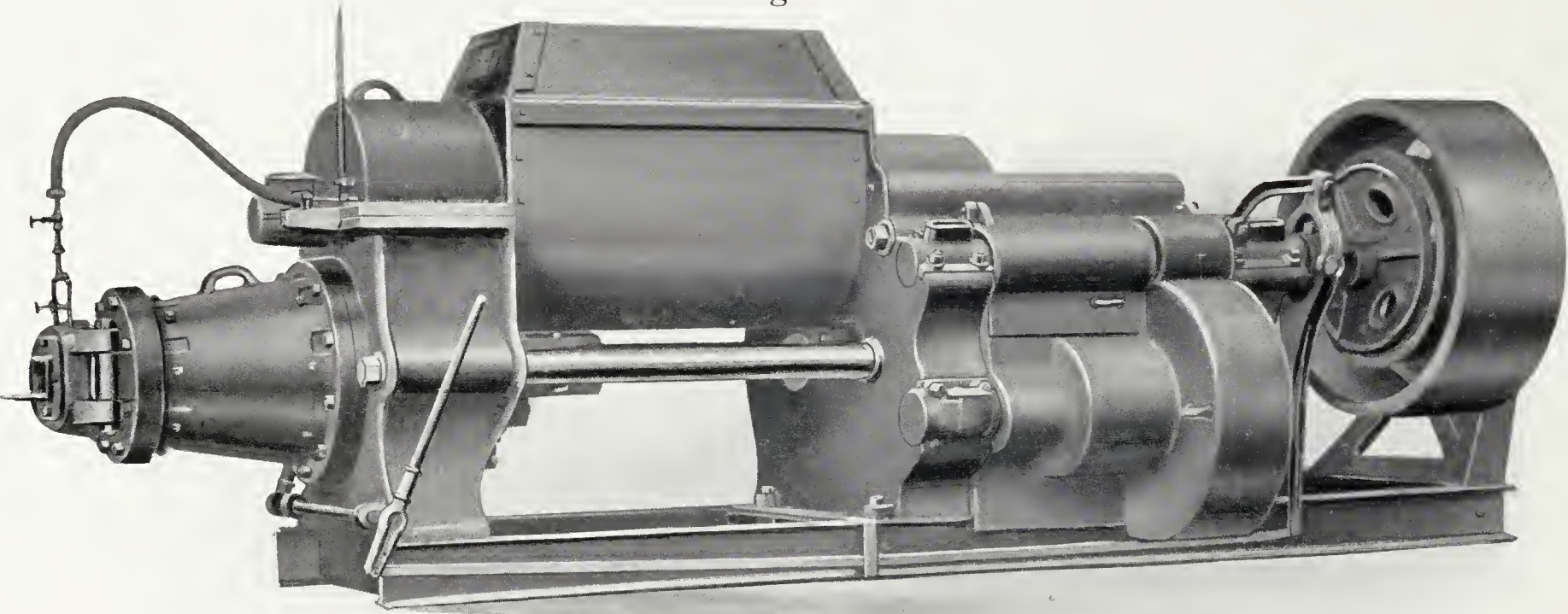
They have various points of advantage.

In many cases the use of a separate Pug Mill or clay mixer can be avoided, as a long or short feeding or mixing chamber is made a part of the construction.

Our "J" Size Union Machine is here shown with long mixing chamber.

It is one of the largest, heaviest ever offered, and is suited for use in plants of largest capacity.

Fig. 181



“J” UNION MACHINE, SHORT PATTERN

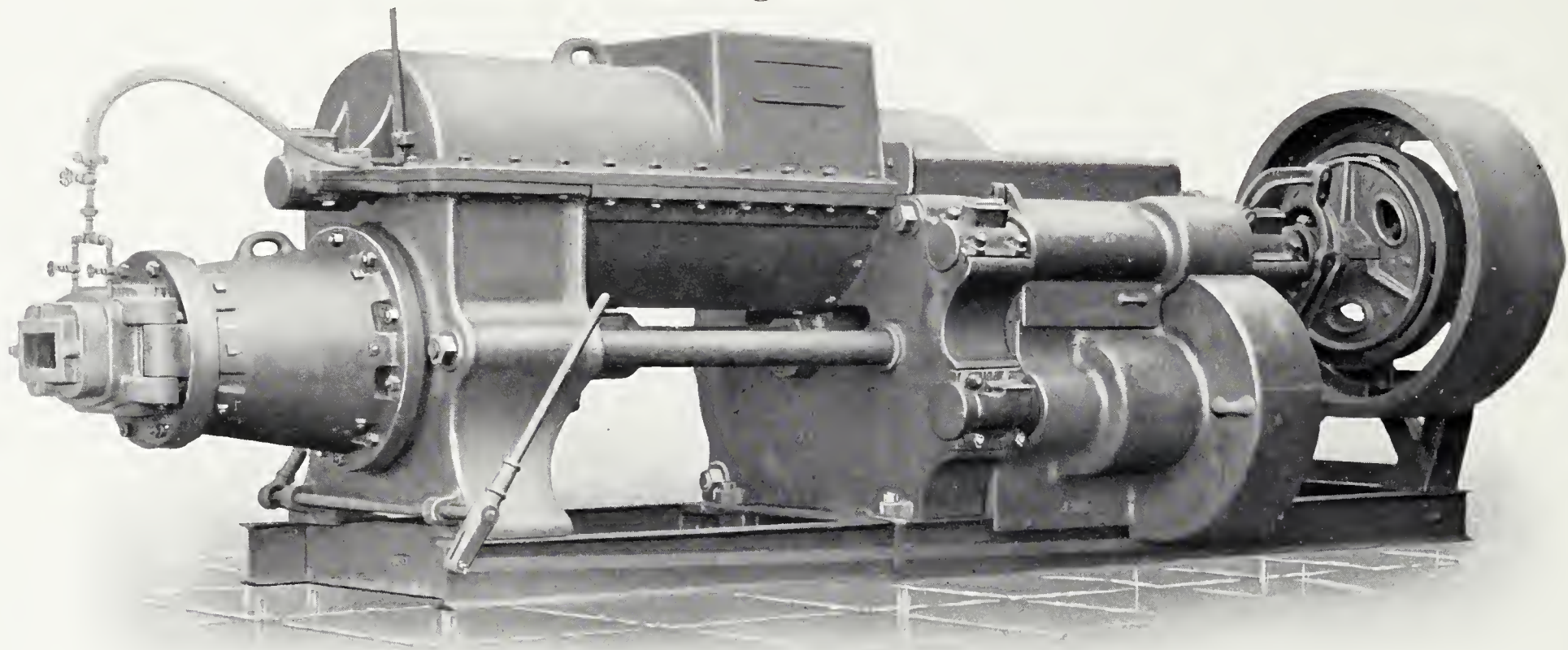
Capacity, 60,000 to 120,000 brick per day.
Length, over all, 20' 1"
Height at front of Pug Mill, 6' 5"

THE type of this machine here shown is made with short feeding chamber, and is intended for use with a separate Pug Mill.

As the hopper or opening to receive the supply of clay is very large (54" x 30"), clogging is avoided, and a steady and uniform supply of clay is fed to the auger chamber below, thus tending to produce a more constant flow of clay from the die and, consequently, increasing the average daily output.

The design of our Union machines is such that a feeding chamber of any length may be had without the use of a long projection of the auger shaft beyond its journal bearing, and, besides the fact that in these machines the projection is short, it is also true that in every case the auger shaft is supported by three journal bearings.

Fig. 181A.



“ J ” UNION MACHINE — CLOSED FEEDING CHAMBER

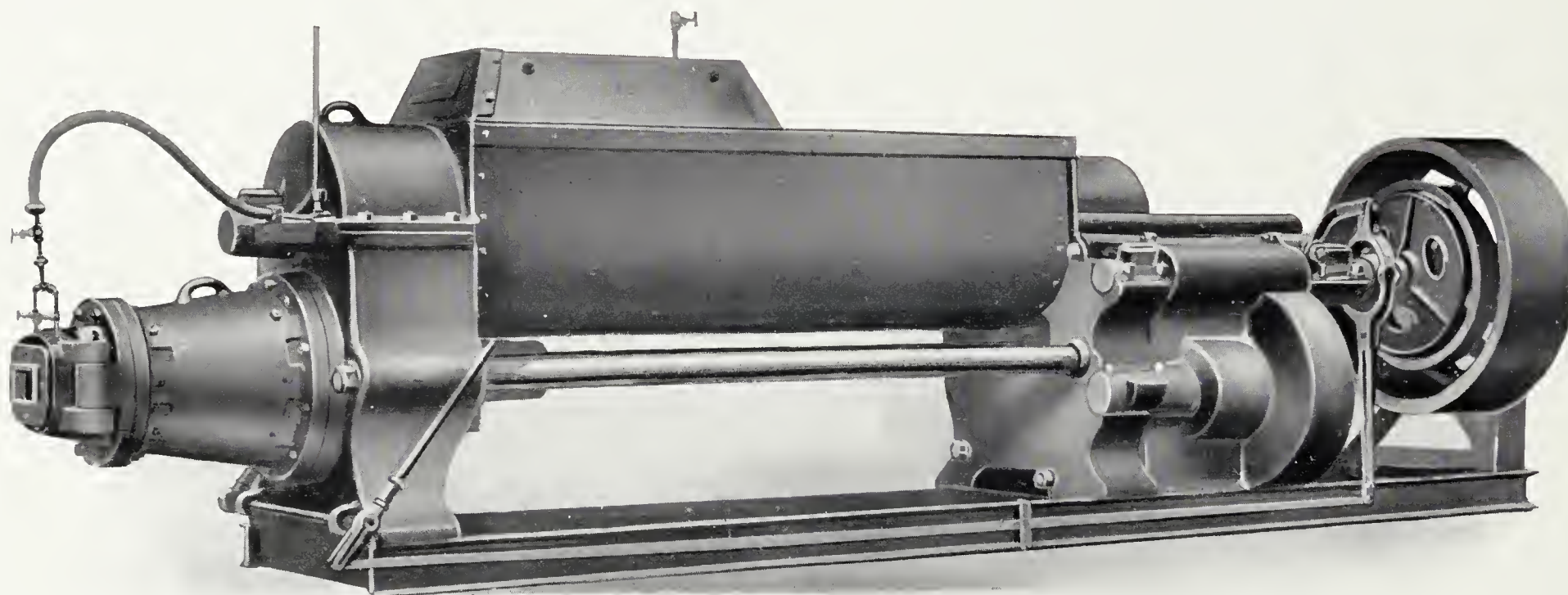
Capacity, 60,000 to 120,000 brick per day.
Length, over all, 20' 1"
Height to top of Hopper, 5' 10"

THIS is a modification of the Union type of brick machine with respect to the feeding chamber, which is closed for a part of its length, the effect of which is to somewhat reduce the size of hopper opening, which in this case is 26" x 26". In other respects the construction is similar to that of the machines shown on the preceding pages, affording a long feeding chamber with auger shaft supported by three journal bearings, and having short overhang.

All these machines are mounted on steel I-beam sills connected by heavy cast-iron cross beams, giving them unusual rigidity, and also affording a substantial method of attaching the machine to its foundation. These sills are extended to receive the stand which supports the out-board journal bearing for the pulley shaft.

It will be noted that the gearing, which is of massive proportions, is protected against dust and accident by a removable casing which is provided with hinged openings for convenient access.

Fig. 182



"M" SIZE UNION MACHINE

Capacity, 50,000 to 80,000 brick per day.

Length, over all, 23' 8"

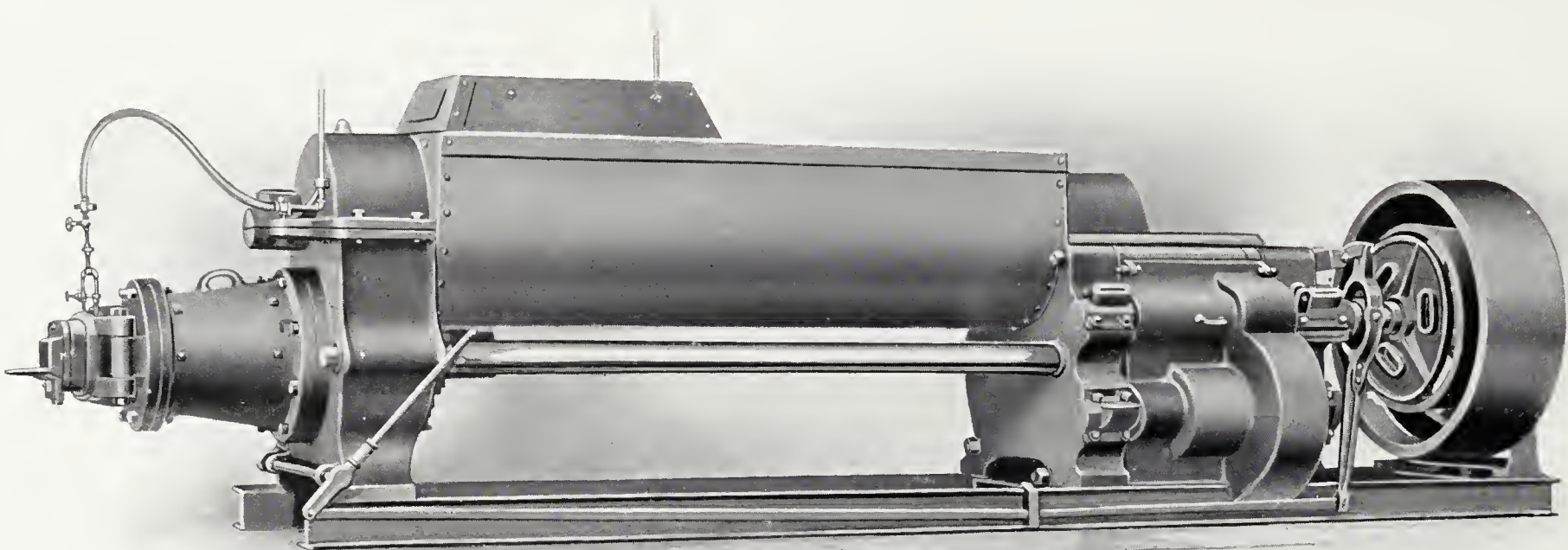
Height at front of Pug Mill, 6' 4"

THIS is our “M” Size Union Brick Machine, and, while similar to the “J” size, is somewhat smaller.

It is here shown with long mixing chamber, but it is also built with short chamber, similar to that shown on page 6.

When the long mixing chamber is used a separate Pug Mill is usually not required, and all the work of mixing and tempering the clay and moulding the brick is performed by a brick machine of this type requiring only one driving belt, and the Pug Mill attendant, being immediately at hand, can easily observe the effect of any temper of the clay, and can be useful in various ways — in stopping or starting the machine by means of the lever on either side, in giving attention to the lubrication of the brick die, and in a general oversight of the machine and cutting apparatus,— all of which are matters of considerable importance.

Fig. 182A



“L” SIZE UNION MACHINE

Capacity, 30,000 to 60,000 brick per day.
Length, over all, 23' 1"
Height at front of Pug Mill, 6' 0"

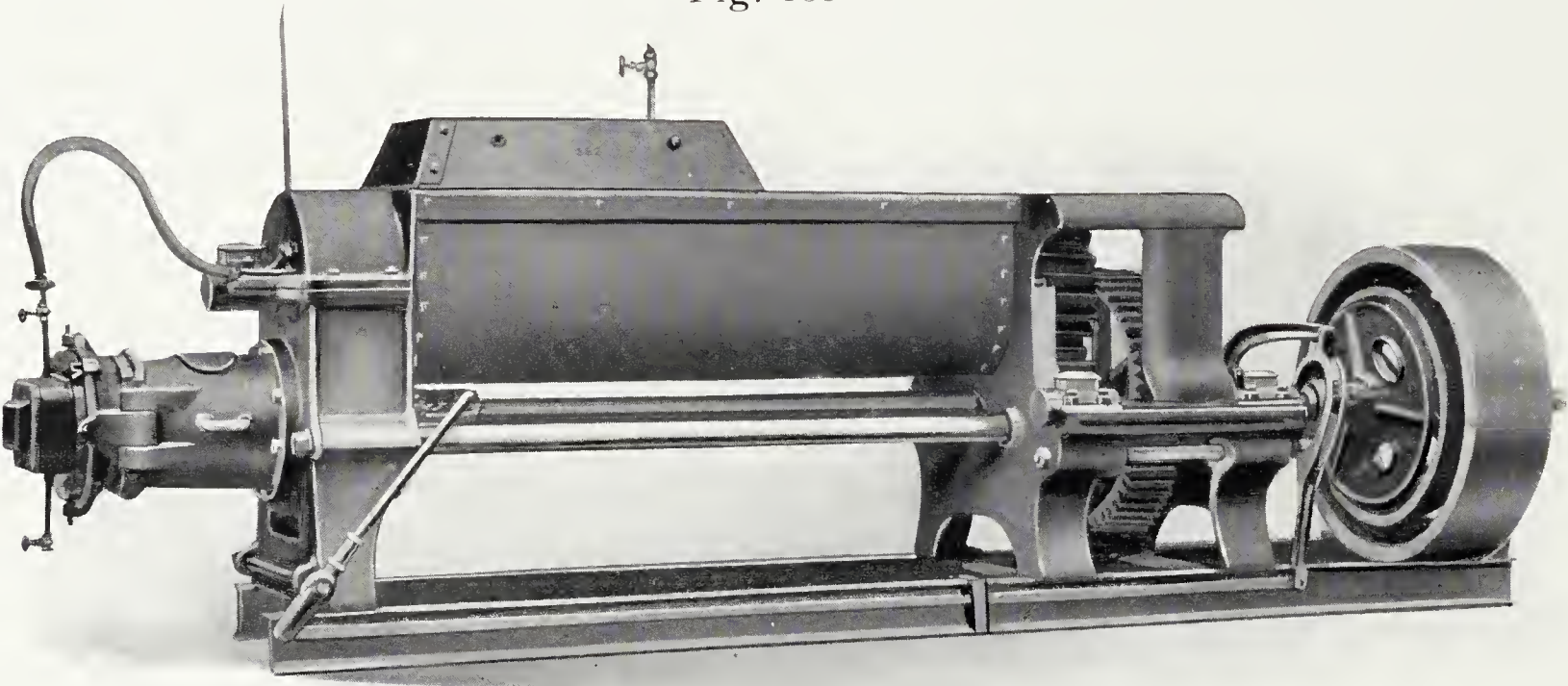
OUR "L" or Intermediate Union Brick Machine is similar to the "J" and "M" sizes in general design, but is one size smaller than the "M."

All our machines are made of good material, carefully selected for the different parts of the work, each according to its purpose. Shafts of high-grade steel. Pinions of steel casting. Mixing knives of crucible steel, forged and hardened where exposed to wear. These are held in iron sockets made in two parts, completely covering the shaft.

Any knife or socket can be removed without disturbing any others on the shaft.

The augers are made of a mixture of extra hard metal. Thus these important parts which revolve in the clay are made to best resist the wear from constant contact with more or less gritty material.

Fig. 183



No. 1 UNION MACHINE

Capacity, 20,000 to 40,000 brick per day.
Length, over all, 18' 7"
Height at front of Pug Mill, 5' 7"

OUR Number One Union Brick Machine differs but slightly in design from that described on the previous page, but is of still smaller size.

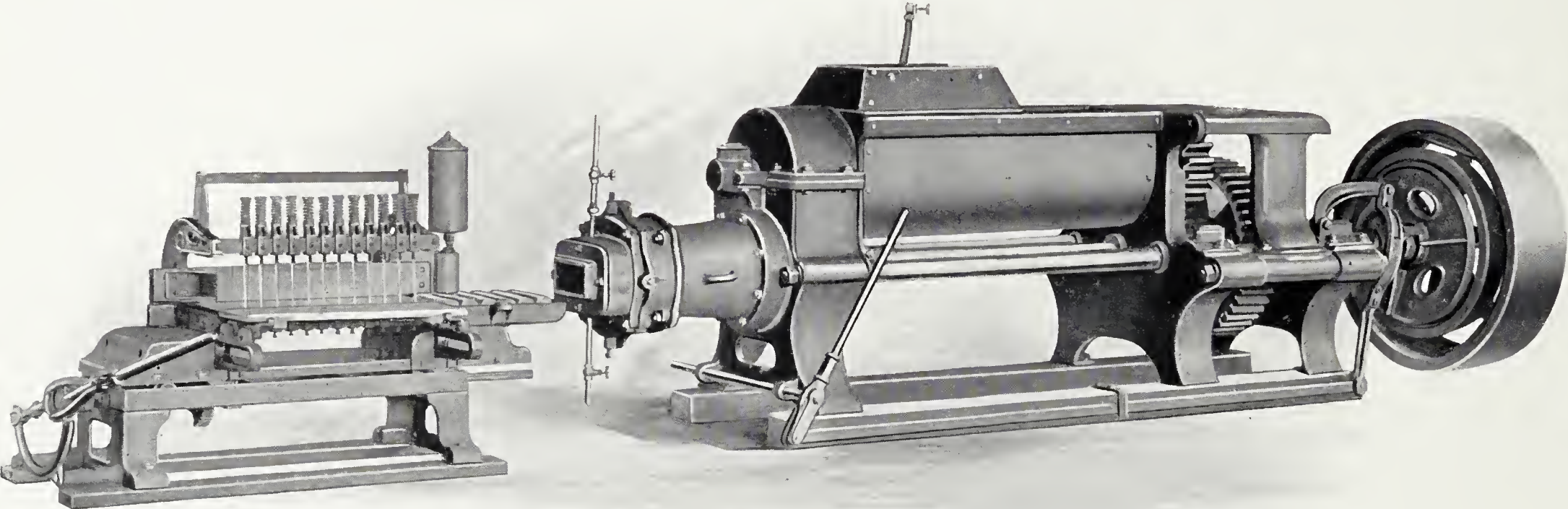
Its simple gearing, while not entirely enclosed, is protected by a covering at the top and sides.

This machine is well suited to the manufacture of either brick or drain tile, and other similar work.

In this, as in our other machines, a friction clutch pulley is provided, this being connected to the levers at the front, by means of which the machine can be easily and quickly stopped, or can be started while the driving belt continues in motion.

In all our machines great care has been taken in designing the gearing, in order that each wheel may be of the proper proportions for strength and wear, and much attention has been given to the shaping of the teeth to the proper curves, and the pattern teeth are accurately machine cut.

Fig. 183A



No. 2 UNION MACHINE WITH BOARD DELIVERY CUTTER

Capacity, 10,000 to 20,000 brick per day.
Length of machine, over all, 15' 7"
Height at front of Pug Mill, 4' 9"

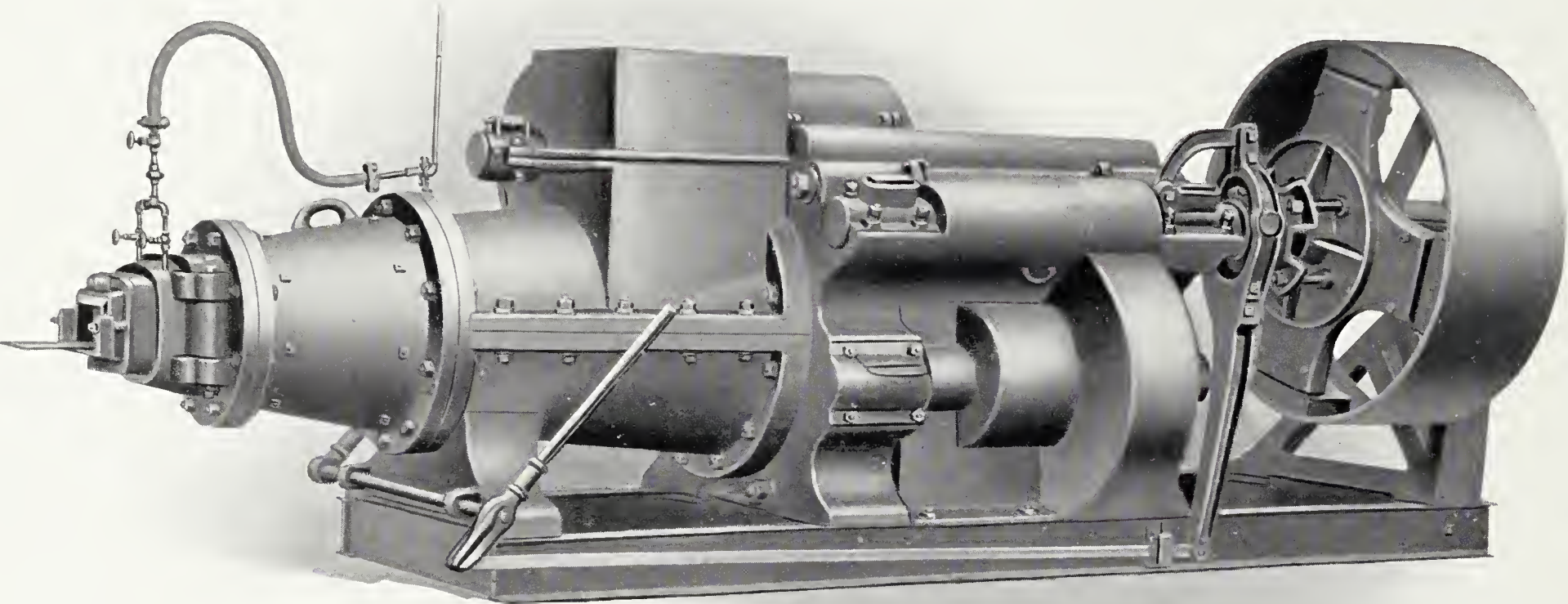
THE Number Two Union Machine here shown is the smallest size we are now building, and is similar in general design to the Number One size. It is used principally for the manufacture of brick or drain tile. The illustration shows this machine arranged for making brick, one of our Standard Board Delivery Cutters being used.

It should be remembered that in our Union Machines the clay is constantly fed from the mixing chamber to the auger by means of curved arms on the mixer shaft. These are designed so as to avoid dead clay between the mixer and auger chambers, and tendency to clog or failure to feed is avoided.

All our Union Machines are provided with a renewable thrust bearing of marine type on the auger shaft, and in most sizes on the mixer shaft also.

These improvements, first designed and made practical by ourselves many years ago, have proved very satisfactory.

Fig. 184



“MAMMOTH” AUGER MACHINE

Capacity, 40,000 to 80,000 brick per day.
Length, over all, 16' 0"
Height at Hopper, 5' 2"

“MAMMOTH” AUGER BRICK MACHINE

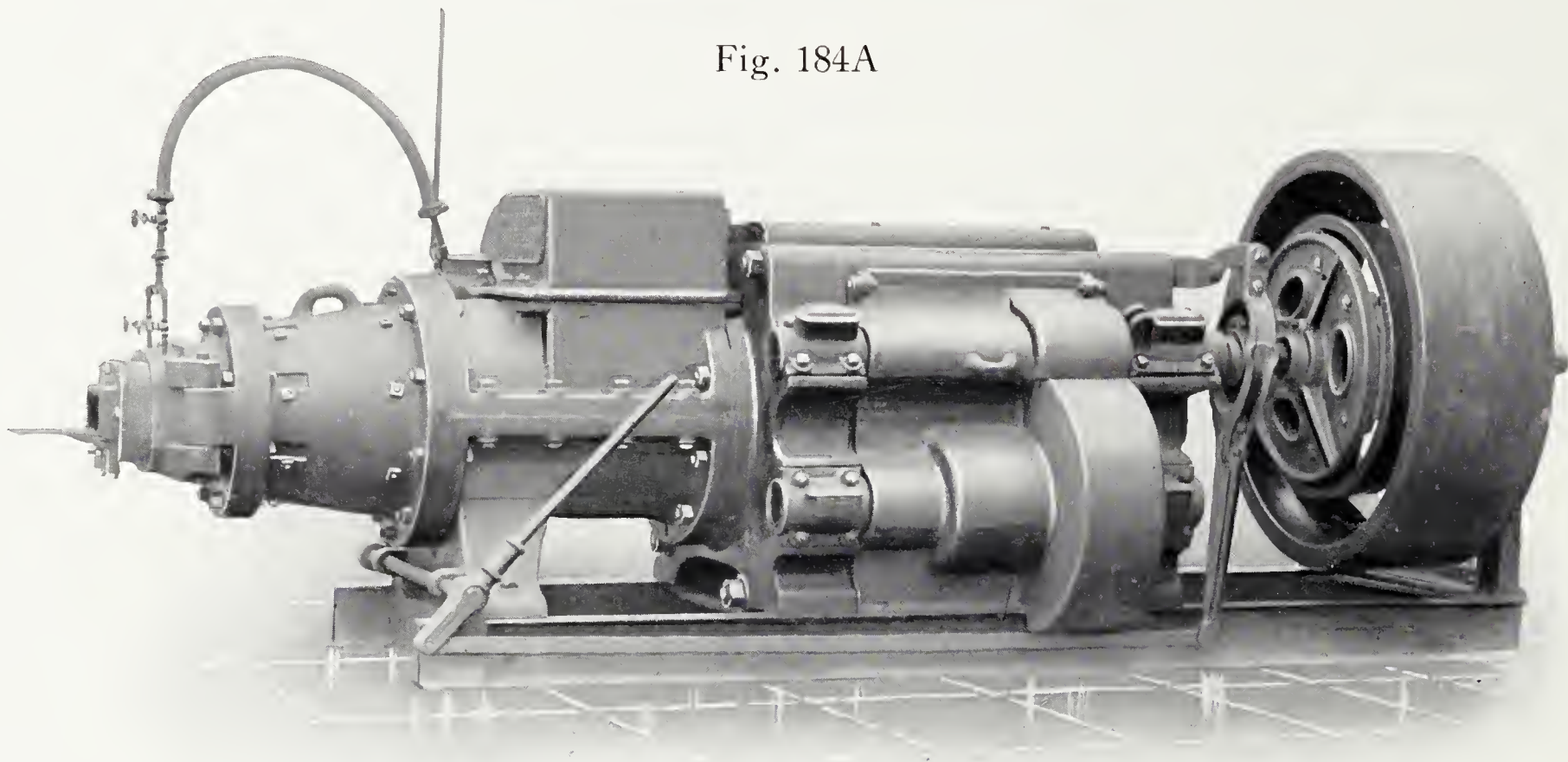
THIS is a machine of massive and well-balanced proportions, and embodies many thoroughly tested improvements.

It is eminently successful in the manufacture of brick, hollow building blocks, fire-proofing, etc.

We invite attention to the construction of the removable hinged front or head used in this and most of our other machines, a heavy flange being provided at the front of the barrel by means of which other heads can be conveniently attached, as may be required for special work. The hinged front is held in place by a safety bolt which gives way in case of undue or dangerous pressure from the use of dry clay or other cause.

The excellence of our steam, oil, or water lubricated dies has long been recognized. They are made of various proportions to best suit the nature of the clay. They can be very conveniently renewed in case of wear, being held in place by substantial bolts,—no trappy screws or putty being used.

Fig. 184A



“MAMMOTH JR.” AUGER MACHINE

Capacity, 30,000 to 60,000 brick per day.
Length, over all, 14' 10"
Height at Hopper, 4' 5"

“MAMMOTH JR.” AUGER BRICK MACHINE

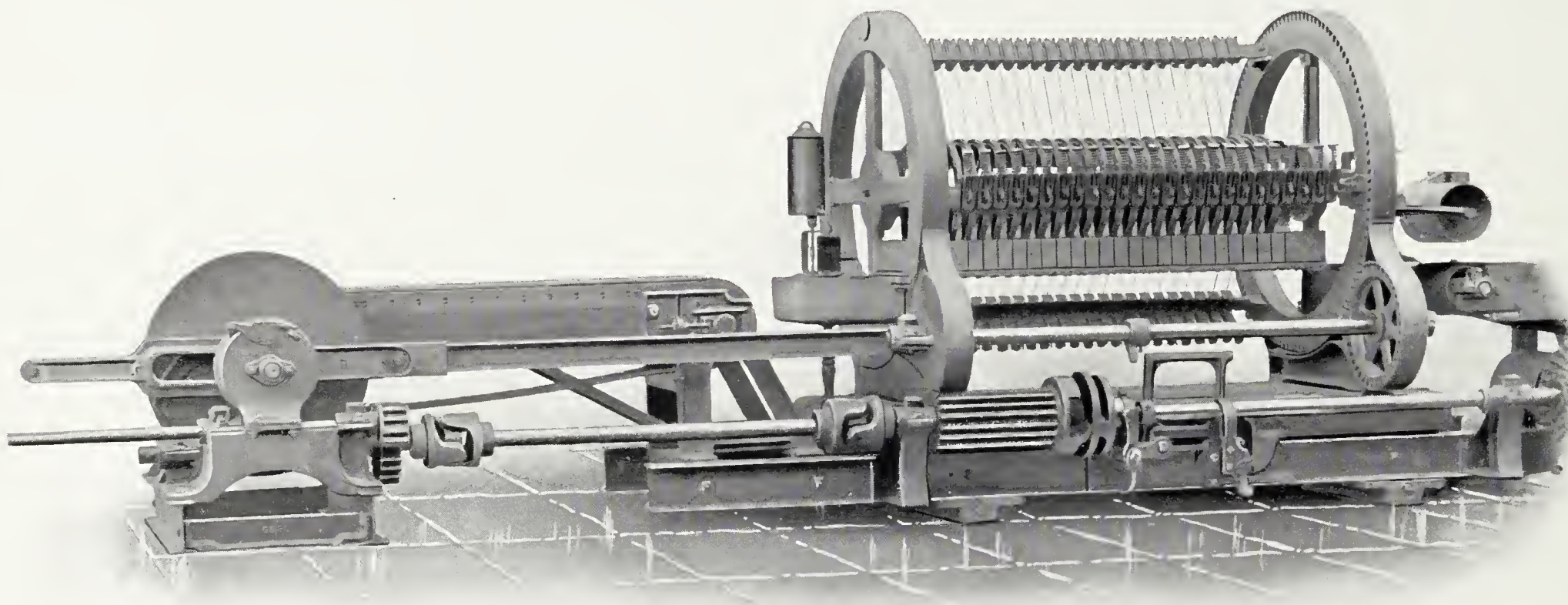
SIMILAR to the “Mammoth,” but somewhat smaller in size, this machine includes all the features of excellence found in that machine, and it is suited to the same class of work.

In both these machines a rotary force feed is used in and at one side of the hopper for preventing the usual tendency of the clay to clog. This improvement is of our invention, and has been long and successfully used by us.

One of the important features of our machinery is found in the fact that the parts used in the construction are made from standard gauges or templates, and are interchangeable, and new parts can be promptly furnished to fit in case renewal is required from wear or accident. Each piece of casting bears a letter or number by which a duplicate can be ordered, or a brief description of the location or use of the part wanted is sufficient.

A complete record is kept of the machinery and equipment furnished each customer.

Fig. 185



SIZE 40 ROTATING AUTOMATIC CUTTER

Capacity: To 75,000 brick per day.

Length, with 20' Separating Table, from die, . . . 38' 8"

Height to top of Cutting Reel, 6' 3"

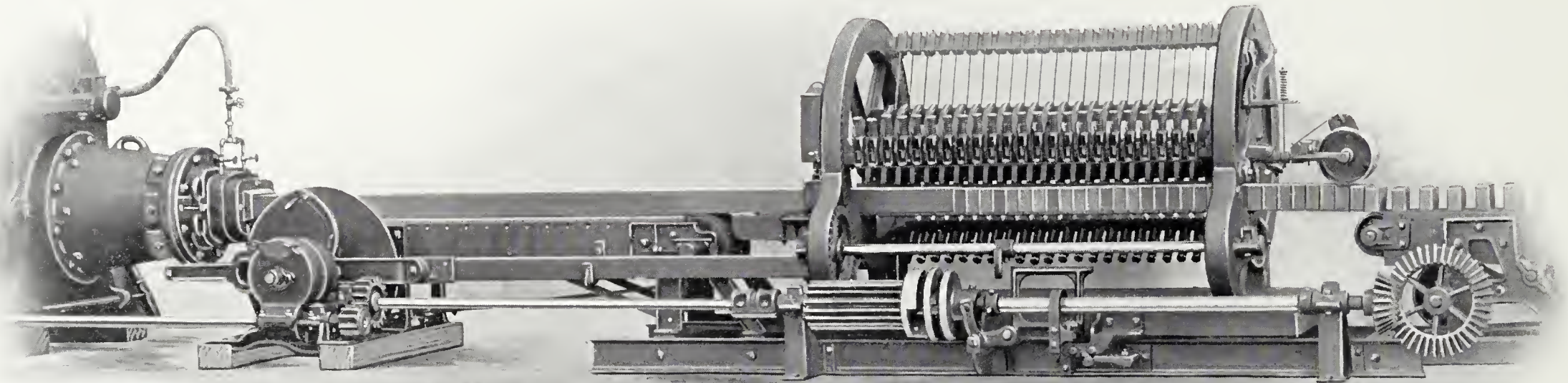
SIZE 40 ROTATING AUTOMATIC CUTTER

AT present we build three sizes of our Automatic Cutters of this type, this being the largest, and it is designed for special work of large size — such as Norman brick, hollow radial chimney blocks, etc. It can also be used for standard brick, but it is not so well suited to large capacity in standard brick as the Size 24 Cutter.

Convenient lateral adjustment of the cutting part of the apparatus and vertical adjustment of the measuring table by means of screws is provided, when necessary, to suit varying sizes of dies, without disturbing the separating table. It will receive a bar of clay thirteen inches wide, and is modified, when necessary, to receive larger sizes.

The general design and all the details of these Cutters have been carefully studied, with the view of securing simple and durable construction, positive operation, and the cutting of clay wares to exact and uniform thickness and with smooth edges.

Fig. 185A



SIZE 24 ROTATING AUTOMATIC CUTTER

Capacity: To 100,000 brick per day.

Length with 20' Separating Table, from die, . 38' 4"

Height to top of Cutting Reel, 5' 4"

OUR ROTATING AUTOMATIC CUTTERS

AS is true of many other important improvements in Clay Working Machinery, we were the pioneers in the invention of Automatic Cutters of this type, which have practically revolutionized the production of high-grade side-cut brick.

With these machines the brick are cut with great exactness, square, straight, and of uniform thickness, and owing to the shearing movement of the cutting wires, the edges are left very smooth and perfect.

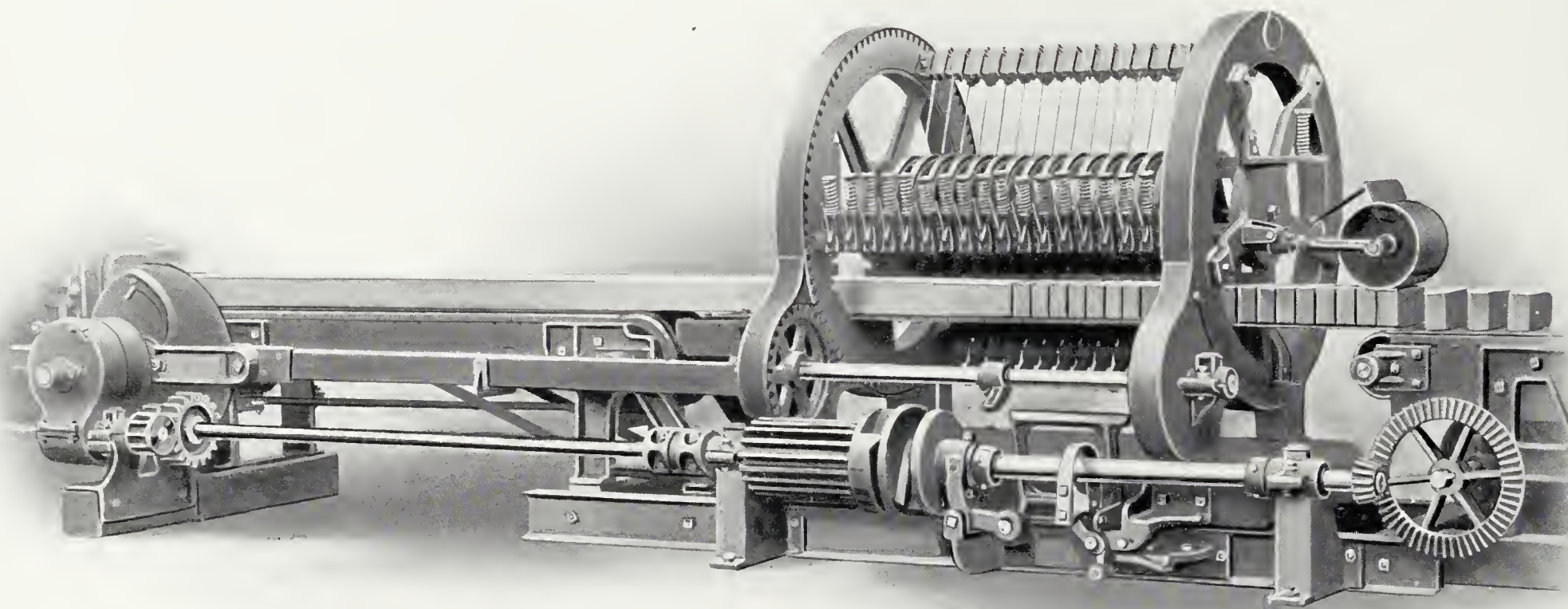
As the clay bar issues continuously from the brick die it is first received on a measuring belt, thence it passes onto the cutting apparatus provided with narrow slots for the passage of the cutting wires, thence, after being cut into brick thicknesses, onto the separating or carrying-away belt, which moves faster than the clay bar, and therefore separates the brick for convenient removal.

The intermittently revolving cutting reel has three steel bars with fixtures for holding the outer ends of the wires, the inner ends being attached to hooks forming a part of each of a series of rings revolving in and exactly supported by three grooved bars. The fixtures and hooks are especially designed with guides to support each end of the wires exactly in proper place.

No central shaft used to support platen plates, these being attached directly to the side bar, which is made in one continuous casting.

(Description continued on page 27)

Fig. 186



SIZE 16 ROTATING AUTOMATIC CUTTER

Capacity: To 60,000 brick per day.

Length, with 12' Separating Table, from die, . . . 28' 2"

Height to top of Cutting Reel, 5' 4"

OUR ROTATING AUTOMATIC CUTTERS

WHEN the clay bar and measuring belt have moved a fixed distance, the cutting reel starts into motion completing one cut while at the same time it is moved longitudinally in unison with the moving clay, insuring a straight cut. This is an important point and is most successfully accomplished in these machines independently of the degree of lubrication of the platen surface.

Power is applied to both the measuring belt and the Cutting Reel from the driving shaft, thus relieving the clay bar from this work and consequent liability to bulge or swell.

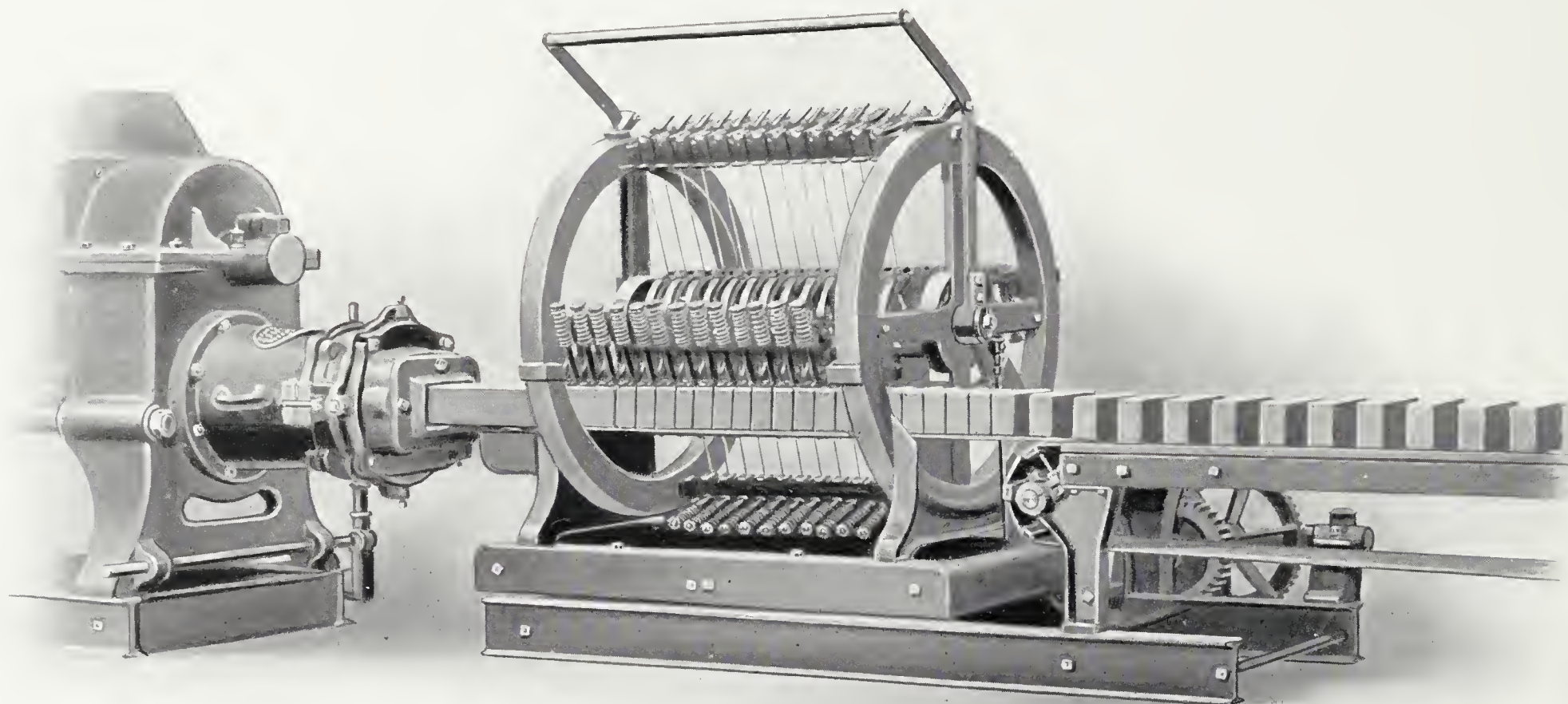
Cutting wires can be renewed without interruption or the loss of a single brick.

The reel rings and the cutter carriage are carried on traveler rollers, avoiding lubrication. There are no parts to be obstructed or worn by waste clay.

The cutting wires are short between supports, affording greatest rigidity. A polished smoothing roller is used at discharge end of Cutter, giving the surface or faces of the brick an additional finish. The surfaces of the platen and side bar can be inexpensively renewed. The platen and its parts can be readily removed and another set can be substituted when the thickness of the brick is to be changed.

These Cutters have earned a wide-spread reputation for excellence.

Fig. 186A



SIZE 12 ROTATING HAND CUTTER

Capacity: To 30,000 brick per day.

Length to end of 10' Separating Table, from die, . 17' 9"

Height to top of Cutting Reel, 4' 8"

SIZE 12 ROTATING CUTTER

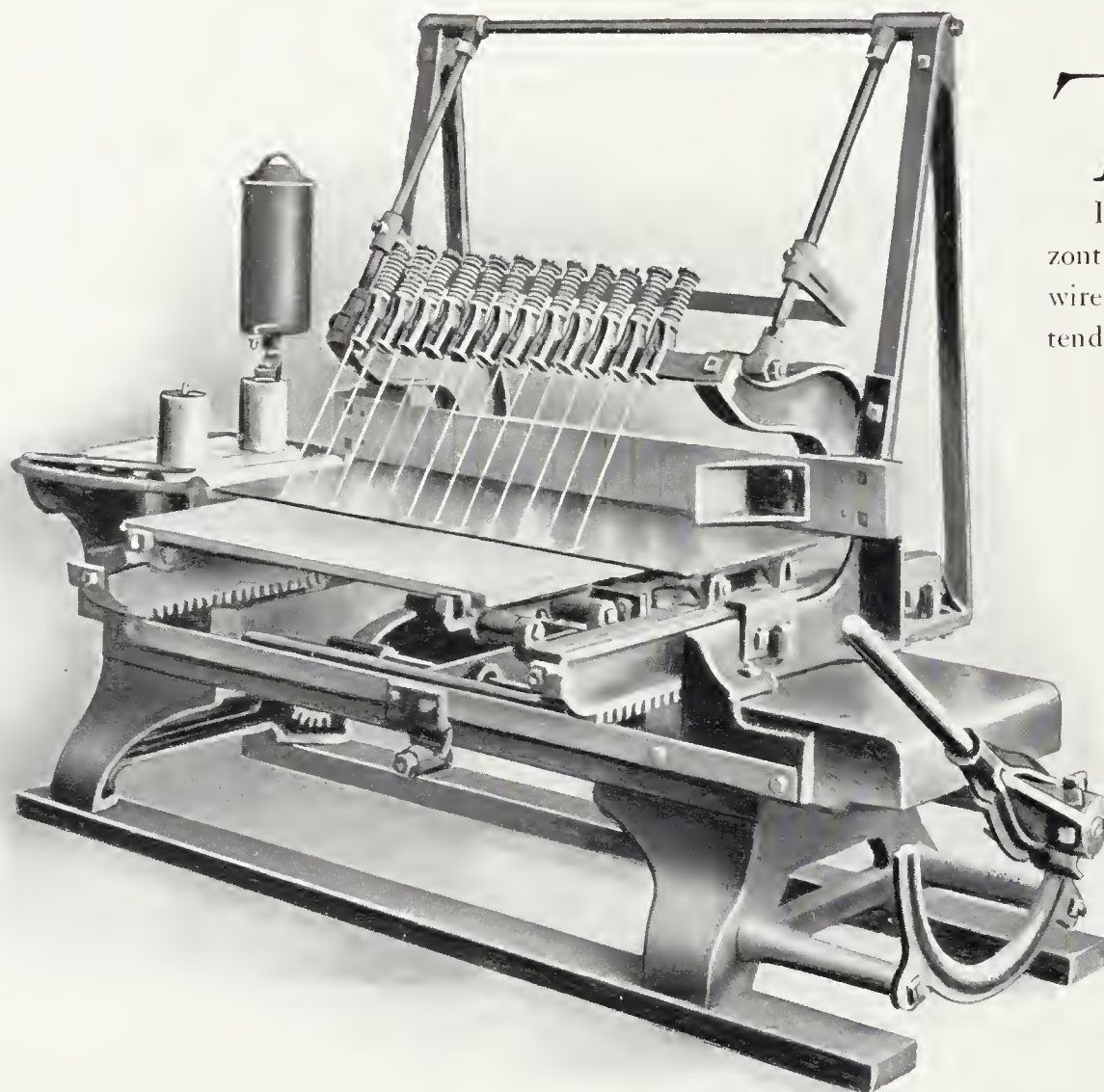
THIS machine is operated by hand, but is constructed upon the same general plan as our Automatic Cutters, and produces straight brick of uniform thickness with smooth and perfect edges. It is designed for plants whose capacity does not justify the expense of an Automatic Cutter, or where a cutter of more portable character is desirable to permit the substitution of other cutters to suit the cutting of drain tile or other work.

Four sets of cutting wires are used in this cutter (instead of three, as in our Automatic Cutters), each coming into operation successively. The fixtures for attaching the wires are similar to those used in our other cutters, by which the loop can be easily and immediately connected, and the wires are given the proper tension without the use of adjusting screws.

Only one operating lever is used — the down movement cuts the brick, and the up movement returns the carriage to the die ready for the next cut. No auxiliary levers, treadles, or wheels are required.

The separating belt is usually driven by a horizontal shaft extended to receive power from shaft of brick machine or other convenient source.

Fig. 187



THIS is a modification of our well-known Standard Board Delivery Cutters, in which the movement of cutting wires is horizontal.

In this Cutter the wires have both vertical and horizontal movement. In passing through the clay the wires move downward, producing a draw cut, thus tending to make the edges of the brick smoother. Can

be used for cutting Roman, Norman, and standard brick. The stroke is adjustable to suit size of work. The working parts are accurately machine finished. The movements are made on anti-friction or carrier rollers.

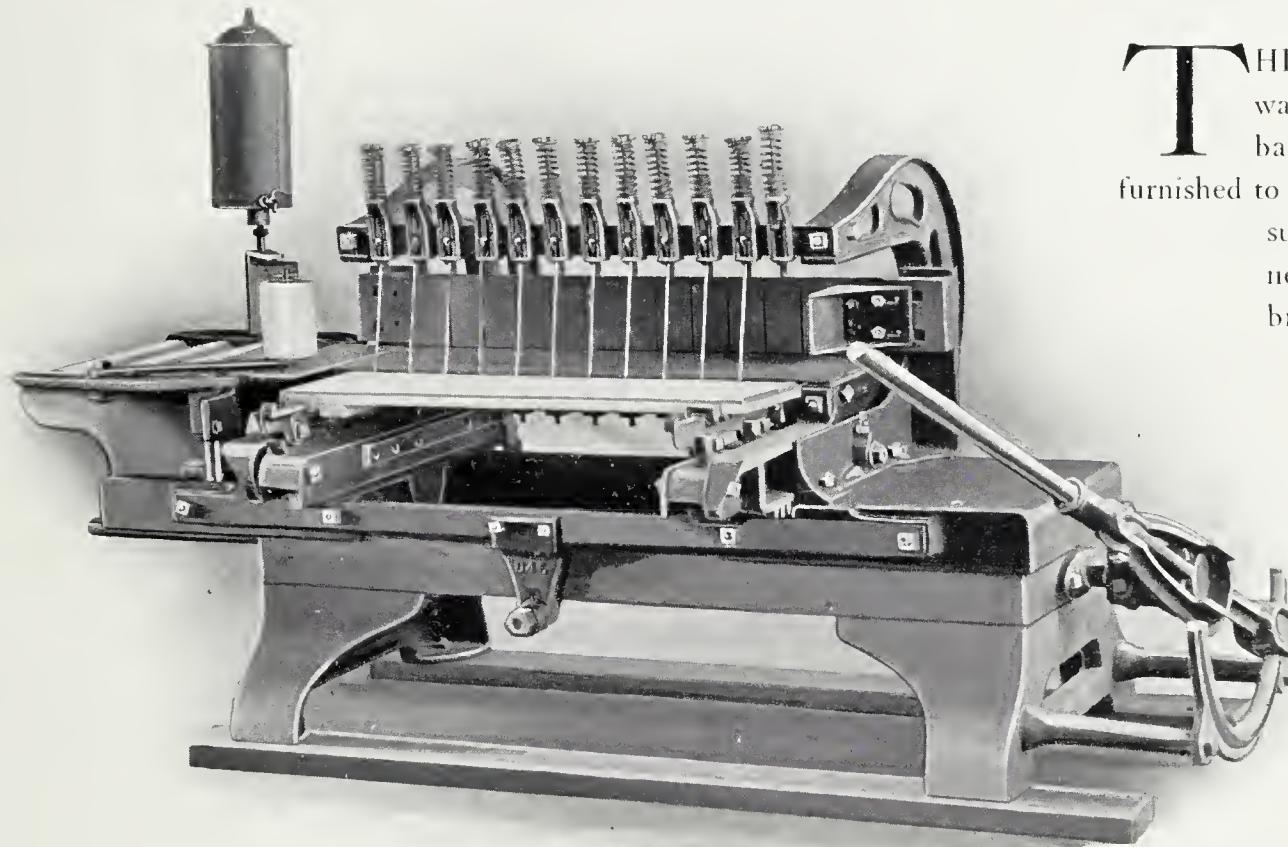
Capacity: To 30,000 brick per day.

Length, including travel, 8' 10".

Height, 5' 2".

DRAW-CUT BOARD DELIVERY CUTTER

Fig. 187A



THIS Cutter is well suited to a variety of sizes of clay wares larger than standard brick. Will receive a clay bar 15 inches wide and $6\frac{1}{2}$ inches high, and can be furnished to cut $12\frac{1}{2}$ inches high. The stroke is adjustable to suit width of work. The parts for changing thickness of cut are inexpensive. Is made to deliver brick either side specified.

The clay is cut straight and square while in motion. Working parts are machine finished. Carrier rollers supporting the moving parts have wide faces. The operation is shown on the following page.

Capacity: To 30,000 brick per day. Length, including travel, 9' 0". Height, 4' 1".

'U' SIZE BOARD DELIVERY CUTTER

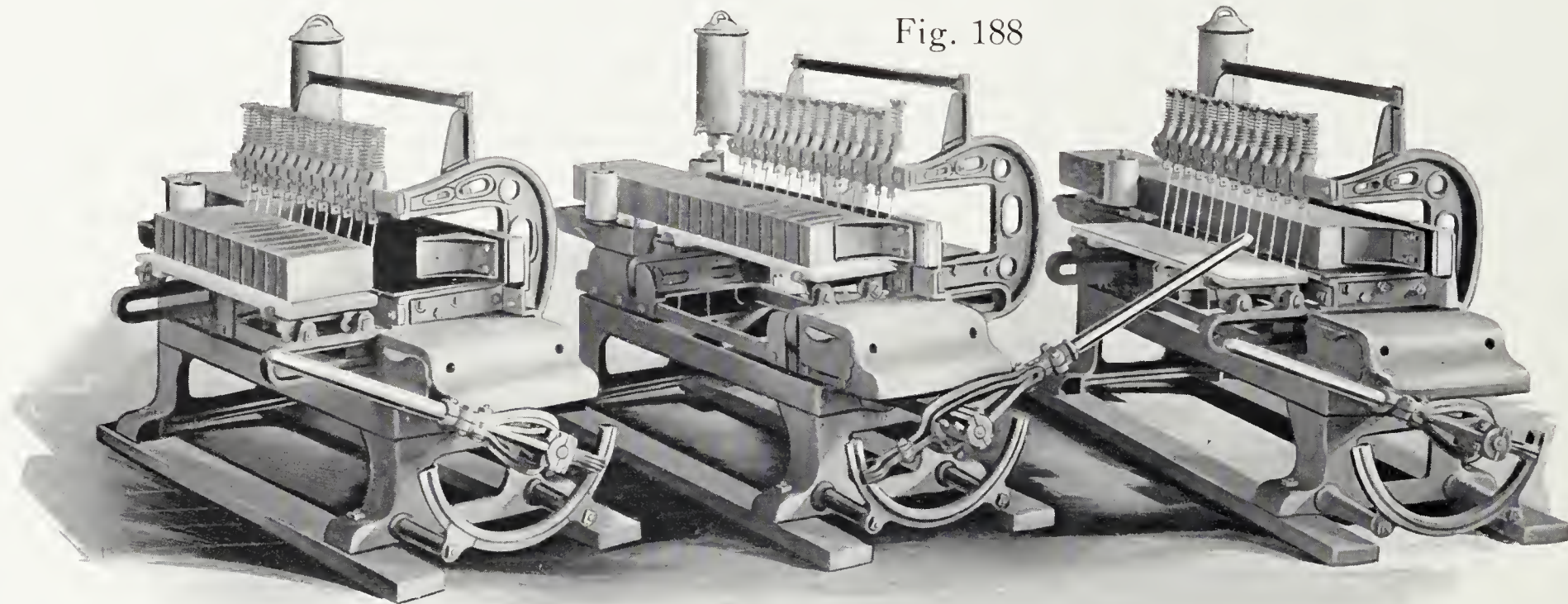


Fig. 188

"T" SIZE BOARD DELIVERY CUTTER

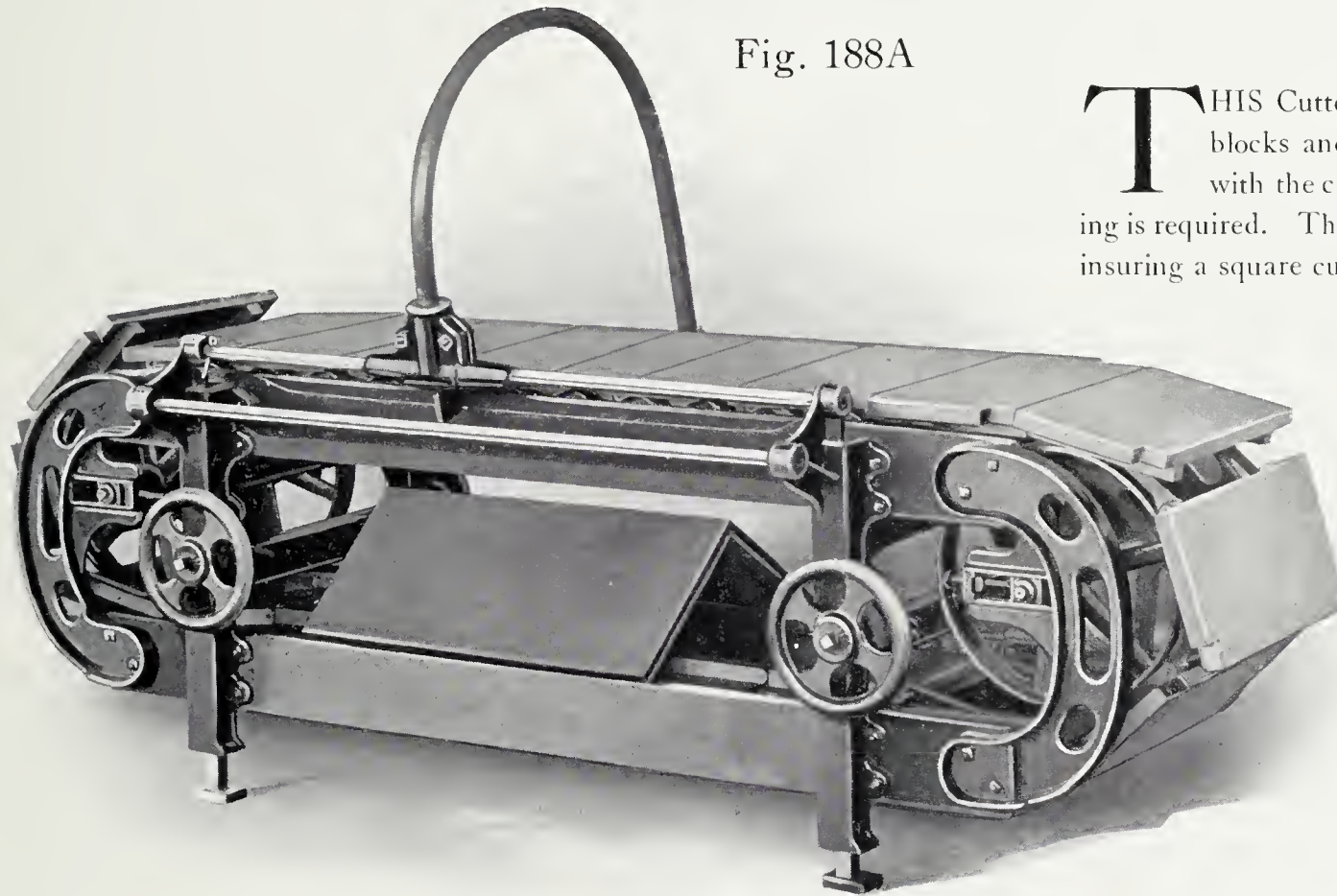
THIS engraving illustrates the operation of our Board Delivery Cutters. In the view at the right the clay has reached the end of platen and moves the carriage with it. Next view shows lever moved over and cut completed. Next shows lever returned and pallet with cut brick ready for removal.

This pattern of cutter is used for brick of ordinary sizes, any thickness, and either square, ornamental, or octagon, also arch, wedge, key, or circle shapes in fire brick.

We were the inventors and first builders of board delivery cutters cutting the bar of clay while in motion.

Capacity: To 30,000 brick per day. Length, including travel, 8' 6". Height, 4' 2".

Fig. 188A



HOLLOW BLOCK CUTTER

THIS Cutter is intended for cutting hollow building blocks and similar work. The carrier plates move with the clay. No sliding, and, therefore, no lubricating is required. The cutting bow is moved by the carrier plates, insuring a square cut, and of proper length. Wires pass down in narrow slots between carrier plates. The blocks can be received on a pallet held by the attendant to receive them. Can be used for cutting headers or stretchers, the latter either full or half lengths. Height of carriers is conveniently adjustable. Length of cutter, 8' 0". Minimum height to top of carriers, 2' 1".

THIS type of Pug Mill is adapted to the thorough mixing and tempering of material for the largest brick machines. It is regularly built with steel mixing chamber, ten, twelve, fourteen, or sixteen feet long. It has enclosed gearing, steel pinions, adjustable discharge opening, bearings set away from the clay chamber, steel shafts of large diameter, and its construction throughout is just a little heavier and better than seems necessary.

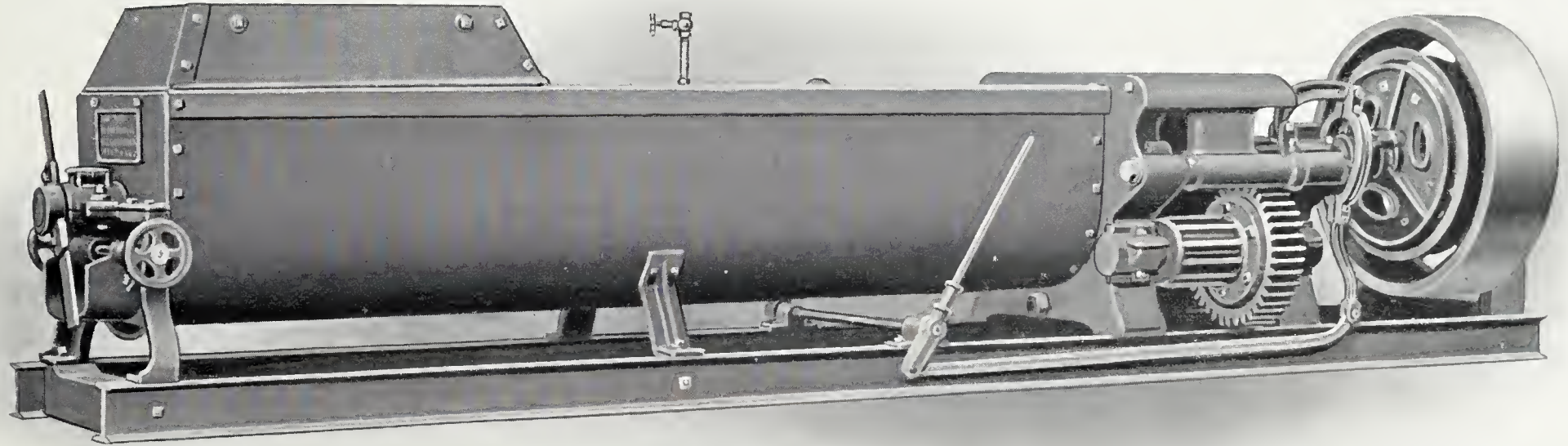
Capacity: Material for 100,000 brick per day. Length, with twelve-foot shell, 23' 2". Height, 4' 11".

Fig. 189



No. 12 PUG MILL

Fig. 189A



No. 9 PUG MILL

A MILL of substantial proportions, built with mixing chamber ten, twelve, or fourteen feet long. It is mounted on steel I-beam sills extended to support an out-board bearing for pulley shaft. Discharge opening conveniently adjustable.

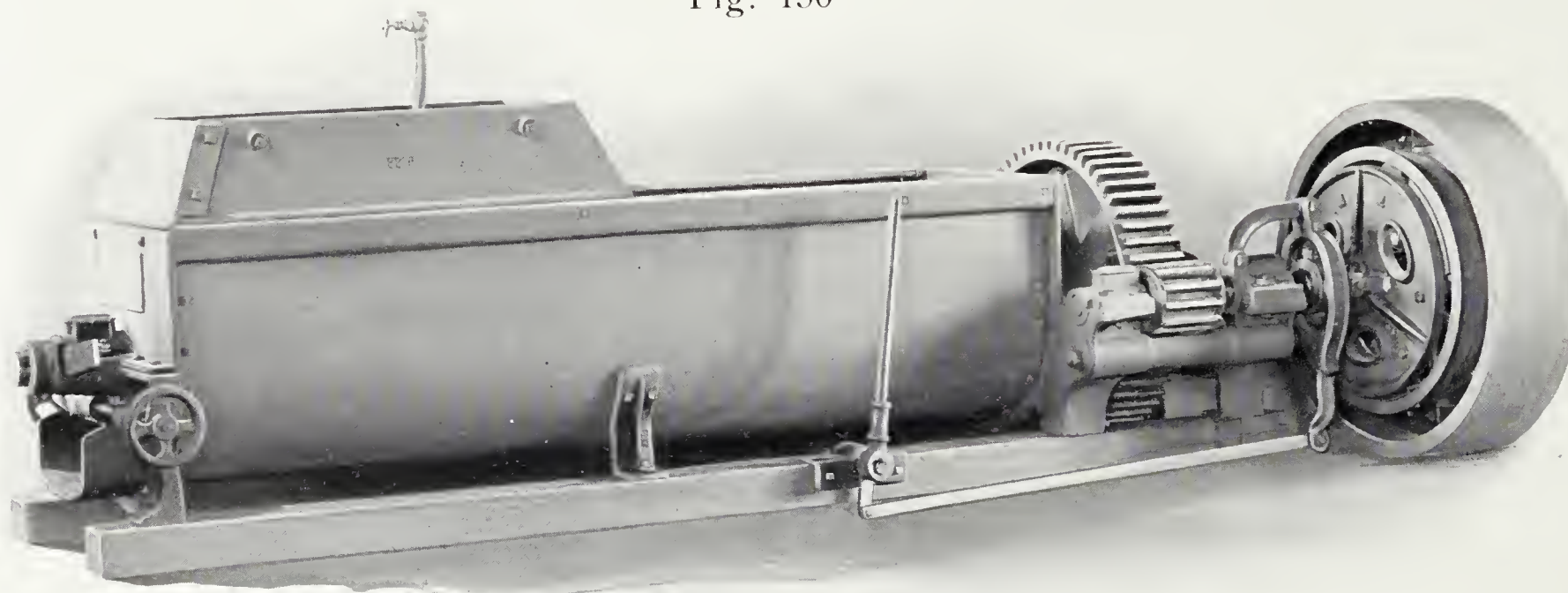
All our Pug Mills have knives of high carbon steel, forged to shape, and hardened. The knives are held in removable clamp sockets, permitting any knife or socket to be removed without disturbing the others.

Capacity: Material for 75,000 brick per day. Length, with twelve-foot shell, 19' 10". Height, 4' 2".

THIS illustration shows our No. 4 Single Spur Geared Pug Mill, usually built with nine or ten-foot mixing chamber — bevel gears are furnished if required. It is also made to discharge at the gear end, with spur or bevel gear drive, — a construction which permits its installation in places where a mill with the usual drive could not be used. All working parts are very heavy and carefully designed to give satisfactory service.

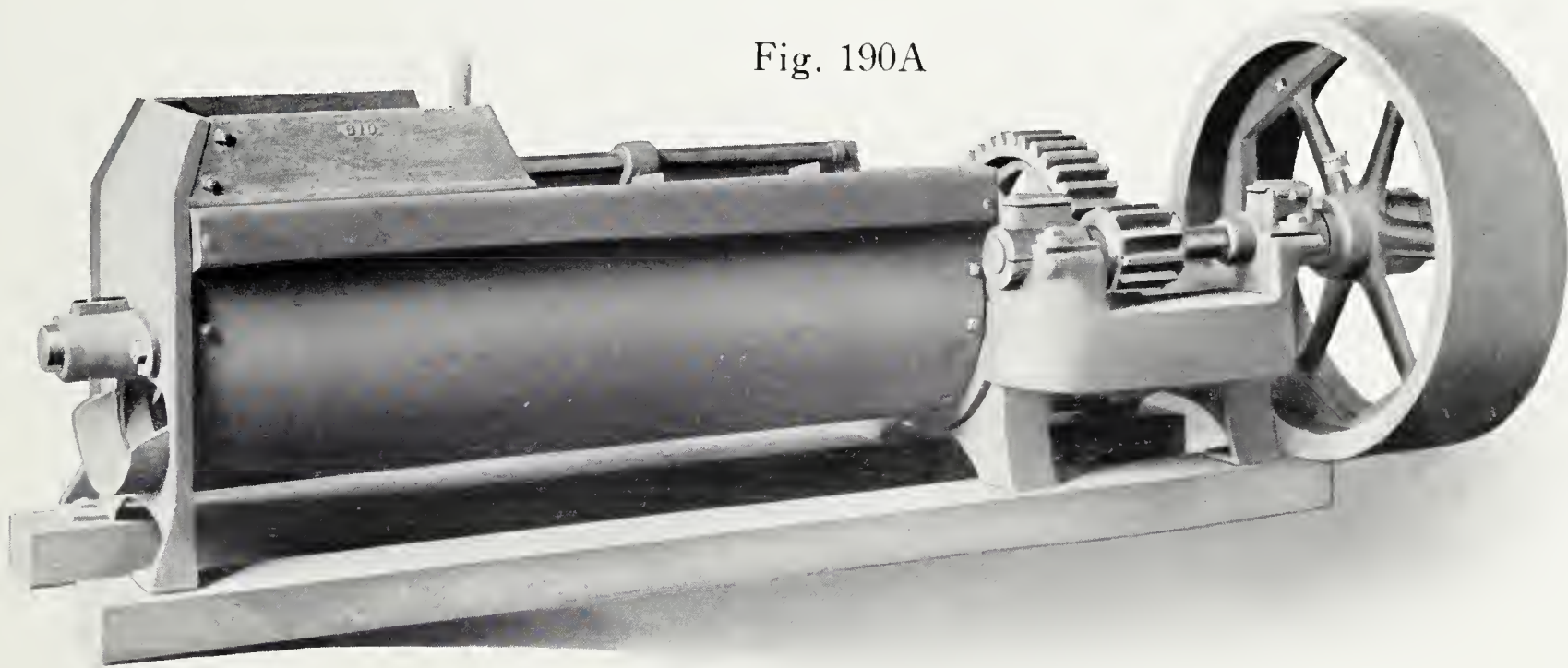
Capacity: To 50,000 brick per day. Length, with ten-foot shell, 16' 10". Height, 4' 1".

Fig. 190



No. 4 PUG MILL

Fig. 190A

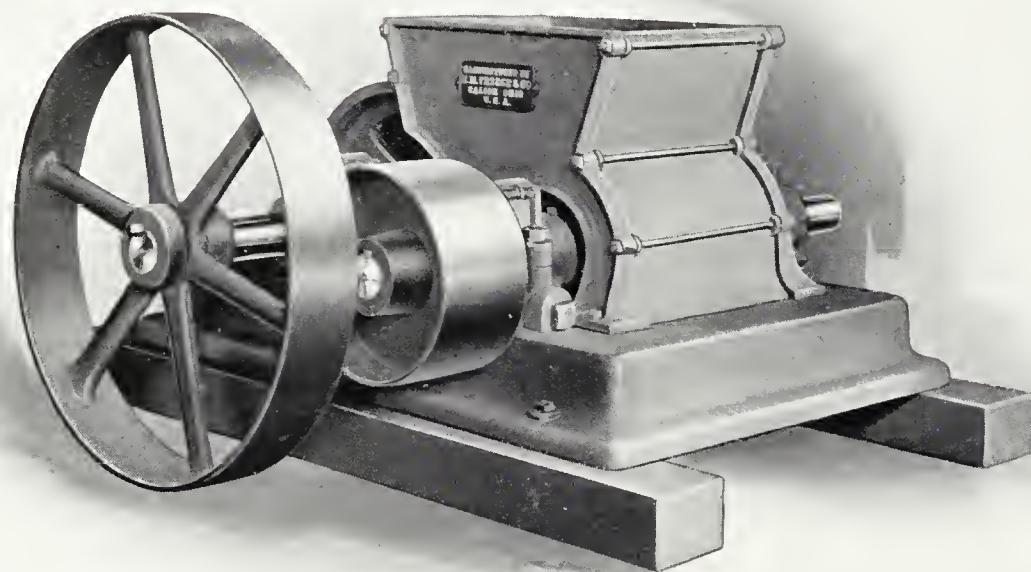


No. 1 PUG MILL

OUR small Pug Mills are built in three sizes, having five, six, or seven-foot mixing chamber. As will be noted in the illustration, the gear frame is exceptionally heavy, and the gearing, shafts, etc., are in proportion. This mill has hardened steel knives, and removable clamp sockets completely covering and protecting the shaft. It is built with spur or bevel gears. Where a small amount of material is to be mixed, we know of no more serviceable or desirable machine.

Capacity: To 25,000 brick per day. Length, with five-foot shell, 9' 3". Height, 2' 10".

Fig. 191



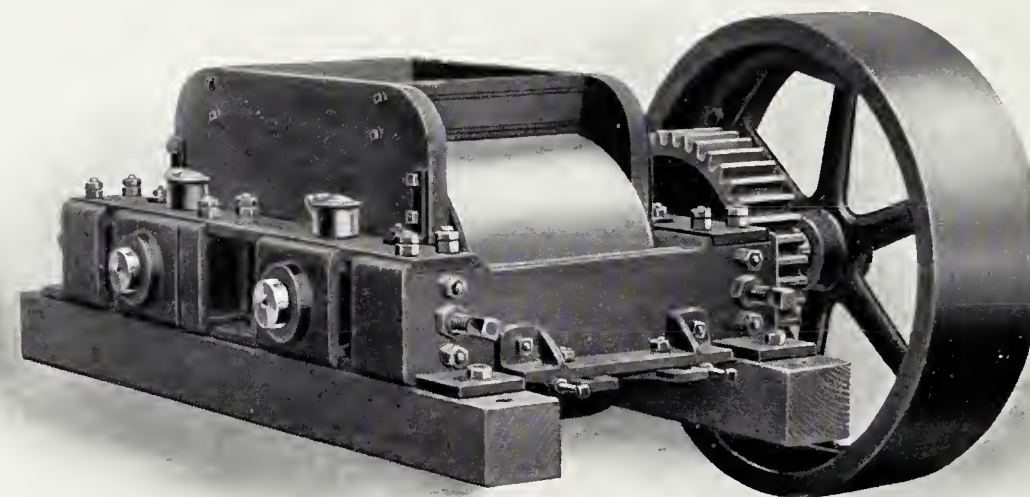
DISINTEGRATOR

THE heavy iron frame forms a rigid support for the roll bearings, these carrying the large or feed roll are adjustable. Face of cutting roll is renewable, and carries six reversible steel cutting bars.

The steel roll shafts are of large diameter, and journal bearings are long.

This machine feeds readily, and is excellent for preparing lumpy or stony clay. Floor space 5' 8" x 5' 8". Height at hopper, 2' 11".

Fig. 191A



THIS Smooth Roll Crusher is made in two sizes. The heavy rolls are of chilled or hard iron. Faces are ground. The steel shafts are of large diameter. The steel side frames connecting the roll bearings are of ample strength. Adjustable scrapers are used for keeping rolls free from clay. Can be furnished with heavy spiral springs, allowing rolls to yield in case of excessive pressure, also causing rolls to receive clay more readily. Floor space, 6' 3" x 5' 2". [Height at hopper, 2' 3".

SMOOTH ROLL CRUSHER

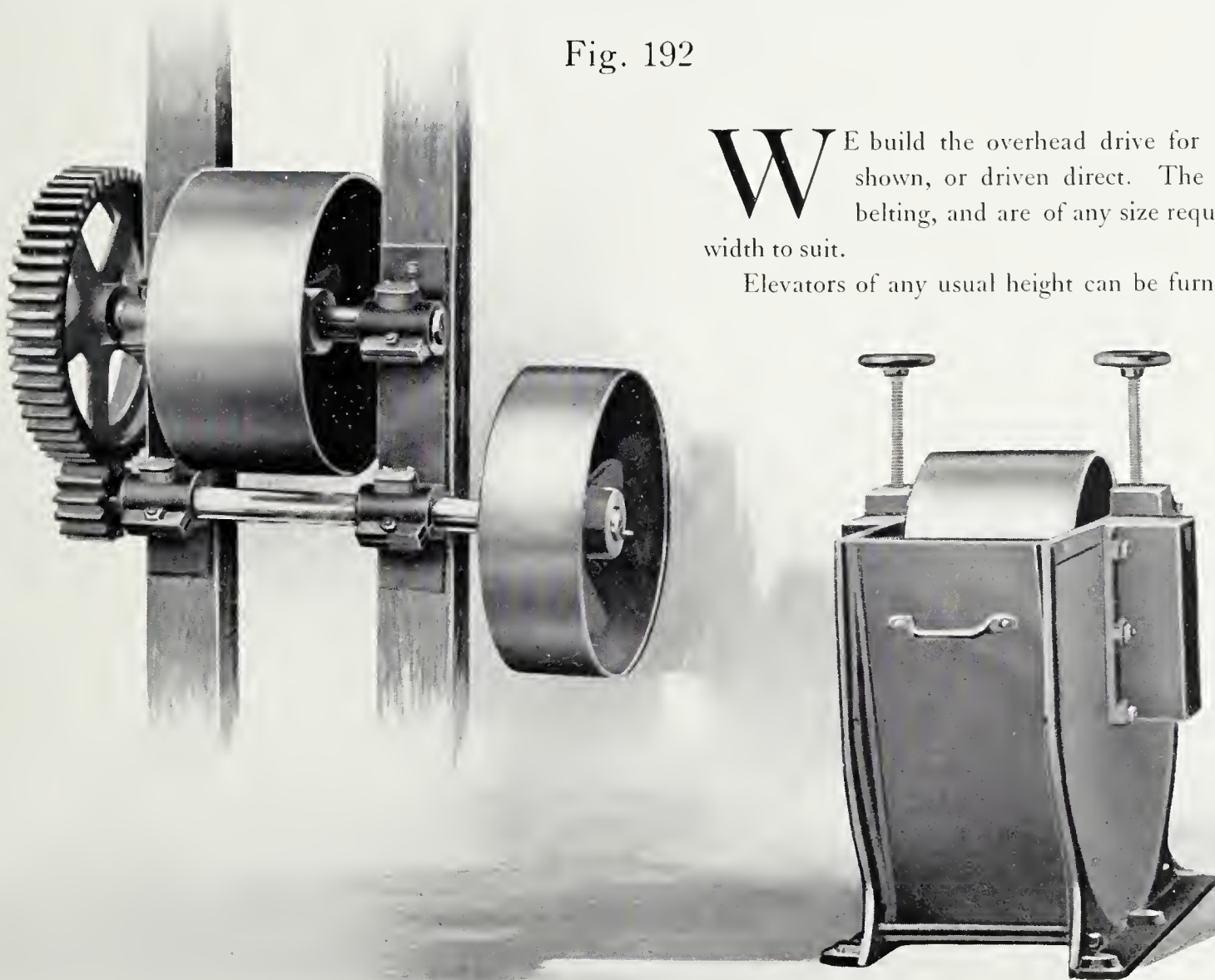
Fig. 192

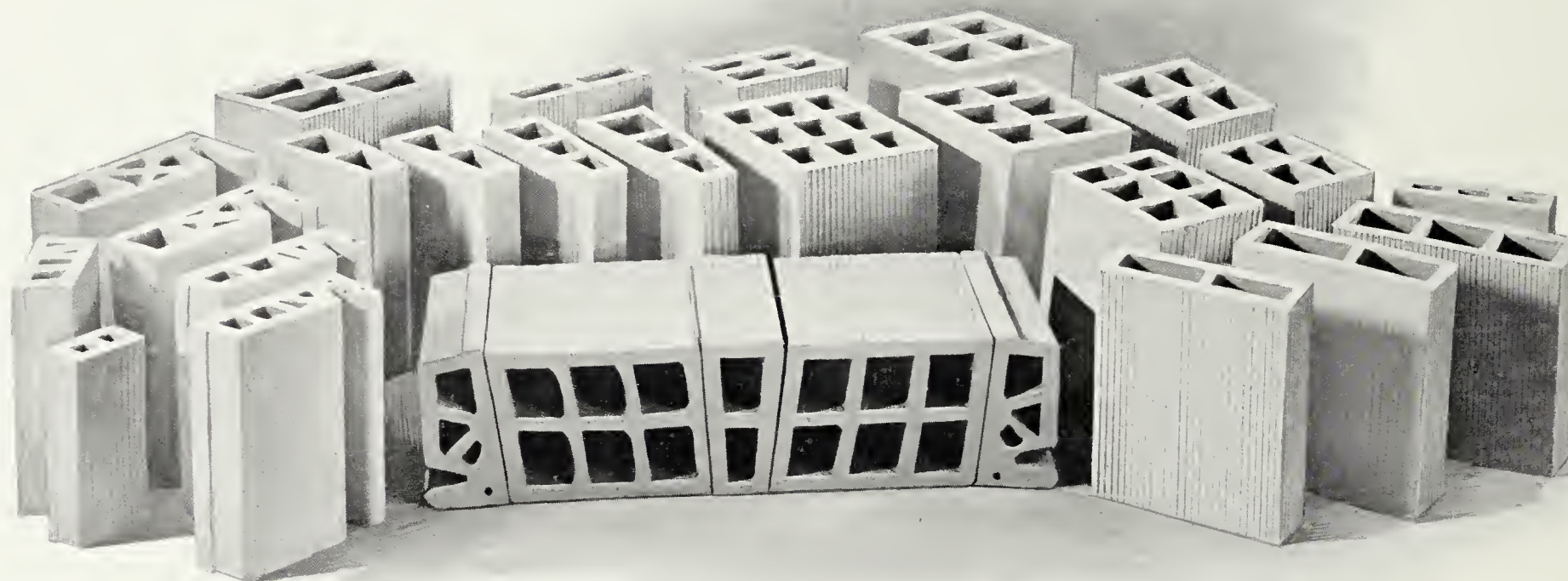
WE build the overhead drive for Bucket Elevators either geared, as shown, or driven direct. The steel buckets are bolted to heavy belting, and are of any size required — the belt being of the proper width to suit.

Elevators of any usual height can be furnished.

This Elevator Boot is of an improved and very heavy pattern. The journal bearings are adjustable, and are protected from dust. One of the ends of the boot can be raised, being made of steel plate sliding in grooves, and is held in position by a cam locking lever, allowing a shovel to be used for cleaning out when required.

Made for any width of bucket.





FIREPROOFING. Cut shows twenty-four different sizes made on our machinery. We furnish equipment for the successful manufacture of fireproofing, hollow brick, building blocks, electrical conduits, radial chimney blocks, and other hollow ware in great variety of shapes and sizes.

